National Institute of Environmental Health Sciences

Climate/chemistry feedbacks and biogenic emissions

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Abstract:

The oxidizing capacity of the atmosphere is affected by anthropogenic emissions and is projected to change in the future. Model calculations indicate that the change in surface ozone at some locations could be large and have significant implications for human health. The calculations depend on the precise scenarios used for the anthropogenic emissions and on the details of the feedback processes included in the model. One important factor is how natural biogenic emissions will change in the future. We carry out a sensitivity calculation to address the possible increase in isoprene emissions consequent on increased surface temperature in a future climate. The changes in ozone are significant but depend crucially on the background chemical regime. In these calculations, we find that increased isoprene will increase ozone in the Northern Hemisphere but decrease ozone in the tropics. We also consider the role of bromine compounds in tropospheric chemistry and consider cases where, in a future climate, the impact of bromine could change.

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Resource Description

Climate Scenario : ☑

specification of climate scenario (set of assumptions about future states related to climate)

Special Report on Emissions Scenarios (SRES)

Special Report on Emissions Scenarios (SRES) Scenario: SRES A2

Exposure : ☑

weather or climate related pathway by which climate change affects health

Unspecified Exposure

Geographic Feature: ☑

resource focuses on specific type of geography

None or Unspecified

Geographic Location: ☑

resource focuses on specific location

Global or Unspecified

Health Impact: ☑

specification of health effect or disease related to climate change exposure

Health Outcome Unspecified

Model/Methodology: ☑

type of model used or methodology development is a focus of resource

Exposure Change Prediction, Methodology, Other Projection Model/Methodology

Other Projection Model/Methodology: feedback processes included in the model

Resource Type: ☑

format or standard characteristic of resource

Research Article

Timescale: ☑

time period studied

Long-Term (>50 years)